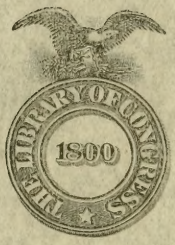
S
571
.C6

SHOUT
SHARE
IT



Class S 571

Book .C6

UNITED STATES DEPARTMENT OF AGRICULTURE

BULLETIN No. 770

Contribution from the Bureau of Markets

CHARLES J. BRAND, Chief

Washington, D. C. January 29, 1919

MOTOR TRANSPORTATION FOR RURAL DISTRICTS.*

By J. H. Collins, *Investigator in Market Surveys.*

CONTENTS.

	Page.
A field for the motor truck	1
Preliminary survey of the field of operation	5
Advance estimate of operating costs	9
Gasoline, oil and grease	11
Drivers' wages	11
Depreciation	12
Interest on investment	12
Repairs	13
Tires	13
Garage Rent	14
Taxes, license and insurance	14
Overhead expenses	14
Selection of operating equipment	15
Size of truck	15
Body equipment	16
Tire equipment	18
Determination of rates	18
Collection and delivery arrangements	20
Farm-to-Farm collection	21
Cross roads collection	21
Central assembling points	21
Delivery methods	22
Collection of money	23
Keeping cost records	23
Utilization of the farm truck	25
The return or supplementary load	26
The central terminal	26
Business arrangements for stabilizing the business of the rural motor operator	28
The standard bill of lading	28
Insurance on loads carried by motor truck	29
Limiting factors	31
Conclusions	32

A FIELD FOR THE MOTOR TRUCK.

The motor truck as a medium for the carriage of farm products is now assuming a permanent place in the general scheme of transportation. It was to be expected that the motor truck would find its greatest usefulness in solving the problem of the "short haul," one of the most difficult problems which has confronted transportation experts during the last decade. The steady growth of our larger centers of population and their increasing demands for larger quantities of food have stimulated the development of producing areas adjacent

* Acknowledgements are due to Mr. Robert H. Black, Assistant in Marketing, who assisted materially in the preparation of the insurance policy provisions included in this bulletin, to various members of the New York and Philadelphia Underwriters' Associations, who reviewed and criticised these insurance policy provisions, and to the Secretary of the Philadelphia Truck Owners' Association, who criticised the proposed bill of lading.

Copy 2

S571
C6

to these consuming centers. These producing areas have been pushed further and further from the centers of population by the encroachment of the city proper. Gardeners and dairy farmers who, a few years ago, were faced with a short haul to the nearby market, now find the horse-drawn vehicle of other days entirely inadequate to cover the increased distance to market. Here the motor truck has offered itself as a transportation medium capable of working effectively within a much wider radius than the horse and wagon. The development of rail facilities for the short haul has not kept pace with the development of crop producing districts near the larger centers of population. The rapid growth of the truck manufacturing business during the past five years in itself would have directed the attention of manufacturers to rural territory as a profitable sales field.

Summing up, it will be seen that three general causes have contributed to the exploitation of the motor truck industry in rural territory. These causes, as we have noted above, are substantially as follows: (1) the growth of our larger cities and the consequent development of nearby producing areas to provide for part of the food needs of these cities; (2) the failure of the railroads to keep pace with the expansion of their short haul business; (3) the development of the motor truck manufacturing interests and the consequent extension of their sales campaigns. The crisis in the transportation field, brought about by the national war emergency, has afforded stimulus to the development of rural motor transportation more powerful than any other general influence. Doubtless the motor truck, in any event, would have established itself as a factor in the rural field. Ordinarily this establishment would have been a slow process, involving the many preliminary steps customary in introducing a new method of transportation. War conditions precipitated action by creating a very unusual demand for transportation facilities of all kinds. Persons interested in the motor truck found the field made ready by emergency conditions over which no individual or group of individuals had control. It has been necessary only to develop the field of action properly. Such development necessitates or presupposes a certain familiarity with the problem as a whole. A suspicion that such familiarity did not exist among those interested in developing rural motor routes was borne out by preliminary investigations, initiated by the Bureau of Markets. An attempt was made to conduct a general preliminary survey of rural motor routes established or in process of establishment. The general purpose of the survey was to secure basic information regarding the desirability of establishing such routes, the methods undertaken by the beginners in this field, and the measure of success which had been attained during the early period of operation.

Material collected in the survey mentioned above shows considerable

D. of D.
NOV 13 1928

differences in the plans adopted by the average inexperienced operator. The word "inexperienced" is used advisedly in view of the fact that the motor truck is a newcomer in the field of transportation and there has not yet been time for many of the important preliminary problems to be worked out and a general understanding of possibilities secured. Investigations show that there are five general classes engaged in rural hauling on a schedule basis. This classification is about as follows:

(1) The farmer who hauls for his neighbor or for the community as well as for himself. In many cases such persons have purchased motor trucks and have afterwards found that their own business was not sufficient to justify the maintenance of such equipment. By arranging to care for part of the haulage needs of their neighbors,

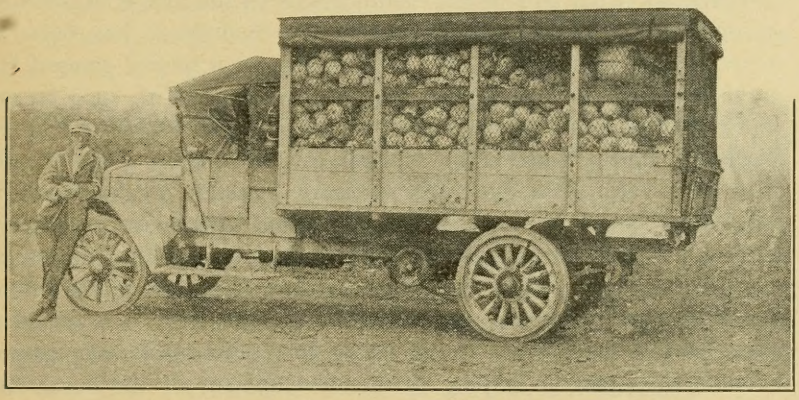


FIG. 1.—The cabbages and cucumbers in this truck load will travel 20 miles to Buffalo, N. Y., and arrive in good condition. The wire netting all around holds a large load in place.

they have made their investment a profitable one, and unconsciously have materially helped the local transportation problem of their communities.

(2) The regular local truck operators with limited capital, whose income is derived largely from their motor trucking business. Some of these persons are small farmers who have embarked in a new business and are willing to devote exclusive attention to the development of local motor routes.

(3) The local automobile or truck agencies that have initiated a motor route as a side line. In some cases the establishment of these routes has been for advertising purposes, the dealers feeling that a practical demonstration of the possibilities of the motor truck would result in increased sales. Often these ventures have proven so successful that they have become a permanent part of the farmers' business and would be conducted for profit even if the advertising value were nil.

(4) The city transfer companies, whose business permits them to undertake rural hauling. Most routes so developed are built on a sound basis. The companies, in most instances, develop their routes in districts familiar to them, where the opportunities for business are fairly well-known in advance.

(5) The large corporation operating a fleet of trucks and commanding considerable capital. There has been an increasing number of this class of operators, and the field has seemed attractive to many men of large capital. Profits during the war period have been such as to make it worth while for men of considerable means to devote serious attention to the building up of motor routes as a regular business.

There are many and varied modifications of the above classifications of operators. Motor hauling during the emergency has been very miscellaneous in character, and conditions do not permit general statements to be made covering the field as a whole. With such an array in the field of motor hauling, it would naturally be expected that there would be a very wide range of operating conditions. Investigations have shown that this is actually the case. Certain weaknesses in the rural motor truck industry have been noticed in connection with these studies, and it is the purpose of this publication to call to the attention of operators and prospective operators those features of the industry which apparently are not understood or appreciated. It is hoped that some of the suggestions contained in this publication may assist in avoiding loss and in helping in the development of the rural motor route on a sound business basis. That rural motor routes in general are not being so developed is evidenced by the unbusinesslike methods adopted by many new operators, including both farmer-operators and the strictly commercial organizations. Present efforts to stimulate the motor trucking industry on the part of those who would profit more by its expansion evidently are not a part of a systematic or well-conceived plan. It is easy to call to mind conditions under which motor truck operation in certain rural districts as a regular business proposition has not proven profitable. These limiting conditions have not received the attention that their importance would warrant. The suggestions on the following pages are designed not so much to give specific instructions on the formation of new rural routes as to call to mind those business arrangements which must in all cases be considered carefully if a venture is to prove profitable. It is hoped that this publication will assist in developing the proper sort of thinking among prospective operators and call up in definite order those basic considerations which must be given attention. The suggestions and conclusions included herein have resulted from a careful study of a large number of typical motor express routes in various sections of

the country. In addition, the Bureau of Markets has been instrumental in establishing motor service in various districts during the early part of 1918 and the methods adopted and the difficulties encountered have furnished material for a fairly comprehensive viewpoint on the entire problem.

Inquiries are constantly being received regarding the practices and methods of successful operators of rural truck routes. It is a regrettable fact that there are practically no rural truck operators whose general plans are worthy of study by less experienced operators. Most rural routes are in the formative stage. For this reason it is felt that a summary of the problems of all will be of mutual interest both to the present operator and to the prospective one. The usefulness of the motor truck for the individual farmer will not be dwelt upon in this bulletin, but we will concern ourselves entirely with the possibilities of the motor truck as a community transportation feature.

PRELIMINARY SURVEY OF THE FIELD OF OPERATION.

Too many beginners delay a canvass of their field of operation until they are definitely committed to the establishment of a motor route by an investment of funds. Such a beginning is decidedly an unwise one. Many an optimistic viewpoint has been changed by a closer scrutiny of the business essentials which must be considered when a rural route is established. It is very desirable, in fact almost necessary, that a thorough business survey be made in advance by the prospective operator. In the first place, an investigation may disclose the fact that it is unnecessary or undesirable to start the route at all. Secondly, a proper investigation may materially modify preliminary plans, particularly with respect to the investment of funds and the selection of equipment. Enthusiastic but inaccurate reports which have been given wide circulation in many districts, have been responsible for some amateur beginnings which should never have been undertaken. The motor route which has a chance for success must be founded on a careful business analysis of the field of operations.

There are four important factors which must be given consideration by the beginner in the field of rural motor transportation. These four factors are: (1) The volume of farm products produced along the contemplated route; (2) the volume of miscellaneous hauling which could be secured to supplement regular loads; (3) competition from other carriers which would be encountered; (4) the character of the highways over which the trucks must run. It may safely be said that the features mentioned above will ultimately determine the success or failure of any rural route.

A motor route established in a sparsely settled or non-productive region is foredoomed to failure. A little thought will make it clear

that a potential supply of commodities must be available for hauling if there is to be sufficient business to make the route a paying one. Secondary only to the total supply is the question of the character of production. A region devoted to the production of a few staple crops moving to market during a comparatively brief season each year will not furnish business for a permanent route. A necessary prerequisite for successful operation is a reasonably dependable tonnage throughout the year. For this reason it follows that the range of the shipping season is of primary interest to the truck operator. Regions of diversified farming, particularly those regions devoted to truck farming, offer the most fertile fields for rural motor transportation. In such districts shipping starts early in the season; new crops are periodically available for market, and the productive season usually extends to the limit set by climatic conditions. Districts devoted to the dairy industry are also potentially rich fields for the motor truck operator since dairying furnishes a dependable and reasonably uniform supply throughout the year. This permits the establishment of a fairly regular routine on the part of the truck operator and to that extent renders easy an efficient and economical conduct of his business.

Consideration should also be given to the nature of the products that will be hauled. Low-priced, bulky staples may not stand the transportation charges necessary to maintain a motor route. For example, it is rather unlikely that hay can be transported by motor truck for long distances except under unusual conditions with respect to price. Perishables may stand the motor truck tariff if the transportation service to market is speedier than the customary means of transportation. Commodities like cream, milk and eggs which are high in price as compared to bulk may bear a reasonably high transportation charge if more satisfactory facilities are offered.

The question of supplementary business for rural truck operators is often an important one. The return load is discussed in a subsequent section of this publication. It is desired merely to take occasion at this point to direct attention to possible side lines of operation which have been responsible for the final financial success of some routes. Arrangements for special hauling outside of the regular schedule are often an important source of income to the rural motor truck operator. Some have found it profitable to care for the tonnage offered by industrial enterprises in their districts. Others do special hauling for farmer patrons outside of regular hours. Usually the operator of a general route secures some profitable business from merchants along the route. These possibilities should be canvassed in advance as their presence or absence may determine the feasibility of the route. Above all, attention should be concentrated on the problem of arranging for loads so that there is a profitable load on all trucks whenever they are operated.

Competition is as important a feature as in other business. The motor operator may find it necessary in some cases to compete with express companies, railroads, electric interurban lines, boat lines, or other truck operators. It is a very unwise policy to ignore the competitor who is already in the field. Every producing district in the country has some sort of arrangement to provide for transportation to market. The wise beginner in the motor truck field will make a survey of existing transportation facilities in advance. He will make

FIG. 2.—Celery in crates is easily carried in most kinds of trucks.

a special effort to foresee the conditions under which the motor truck would fit into existing schemes of transportation. In considering competition, particular attention should be given to rates, schedules and delivery arrangements. These are the factors on which the motor truck must stand or fall so far as concerns competition with other transportation agencies. Some operators have found it possible to compete successfully with rail service and to charge rates rather higher than were charged by the customary carriers. Such a condition is possible only where the truck operator is able to afford a superior service and in districts where patrons are willing to pay a premium for such superior service. Delivery arrangements have always offered a certain amount of trouble to rail carriers and by effecting direct delivery from shipper to consignee with no intermediate delivery charges, the motor truck has been enabled to compete successfully with rail carriers whose rates are slightly less than those of the motor

truck. Freight and express schedules in some districts have been unsatisfactory to the shippers and by offering a more prompt and speedy service, operators have often secured for themselves a very satisfactory tonnage that ordinarily would move by rail.

Good roads are a prerequisite to successful motor truck operation. It is believed that few motor truck operators realize the increased expense which results from travel on poor roads. The prospective operator who plans to move his truck along roads which are virtually impassable or at any rate unsatisfactory, will find that his daily operating costs are far in excess of normal costs of operation, and this one fact alone will seriously affect his profits. A careful road survey will be made in advance by the businesslike operator.

Enough has been said in the preceding paragraphs to indicate the general scope of the preliminary canvass which every prospective motor truck operator should make. The Bureau of Markets has made a fairly complete study of a large number of typical rural routes and has assisted in the establishment of several such routes. The points considered by investigators of this Bureau in making a preliminary canvass of the field of operation may be helpful to operators who contemplate such a study in their own territory. The following outline was placed in the hands of each investigator, and the final report on the feasibility of establishing motor service in any district covered complete reports on each of the items in this outline.

ROADS.
- Character of surface.
- Grades. (As affecting motor hauling.)

LOCATION AND LENGTH OF PROPOSED ROUTES.
- Terminals.
- Towns to be covered. (Distance apart, size, etc.)
- Total distance covered.
- Logical location for route headquarters.

PRINCIPAL COMMODITIES TO BE CARRIED EACH WAY.
- Nature of agriculture along route.
- Commodities to be hauled each way in summer. In winter.

AMOUNT OF BUSINESS WHICH WOULD BE PLEDGED.
- What business would be pledged in summer? In winter?
- Estimated quantity of business by months.
- Of what would return load consist?
- Who would furnish bulk of business—farmers or country merchants?
- Do prospective patrons seem inclined to pledge business?

SERVICE NOW GIVEN BY OTHER CARRIERS.
- What other carriers serve the territory?
- The maximum, minimum and average farm haul to loading stations.
- Schedule maintained by present carriers.
- How do present delivery arrangements compare with proposed arrangements if a motor route should be established?
- Rates charged at present. (Freight and express.)

Schedule Which Should be Maintained.

Number and capacity of trucks which probably would be needed.
When would trucks leave terminals to best serve the territory?
Probable running time over the route.
How many stops should be made and where?

Proposed Methods of Collecting and Delivering.

At how many and at what points would loads be collected?
How would transportation charges probably be collected?
What delivery should be effected both at city and country points?

Local Interest in the Enterprise.

What persons or concerns are most interested? Why?
Could private capital be induced to contribute toward an experimental service?

Permanence of Proposed Route.

Will territory support the proposed route when rail service is normal?
Is there any reason why the route should not be permanently profitable?

It is manifestly impossible completely to outline an ideal investigation which would be satisfactory for all districts. It is necessary to correlate the preliminary canvass with local conditions. The items enumerated in the above outline, however, may offer some suggestions which will be helpful to those interested in the establishment of rural motor transportation routes.

ADVANCE ESTIMATE OF OPERATING COSTS.

One of the first questions to arise in the mind of the prospective motor truck operator is: "What will it cost to operate a truck?" Loads will be arranged, rates will be established, the route will be planned and the truck purchased on the basis of this estimated cost. If the business is to be intelligently planned, it is essential that some idea be secured in advance as to prospective operating costs. The importance of having an idea of these costs in advance can not be over-emphasized.

There are several sources of information which may be helpful to the man contemplating the purchase of a motor truck. Previous personal experience of the operator is exceedingly valuable. Experiences of other operators may often be secured for the asking. Motor truck manufacturers will be glad to furnish prospective purchasers with such information of this nature as may be available. Data secured from truck manufacturers very often do not indicate the conditions under which the figures were secured. Information thus offered is usually an honest attempt to aid buyers but almost invariably there is too much generalization to make such figures a very valuable basis of estimation. Many cost statements issued by truck companies do not take into consideration the varying classes of highways over which trucks run, variations in the load, total monthly or yearly mileage and other important factors. There is a tendency to submit data secured under unusual or ideal circumstances and thus

rendered valueless to the operator who must run his trucks under conditions over which he has little or no control.

Several factors must be considered in arriving at reasonable cost estimates. Among them are: (1) size of truck, (2) probable loads, (3) daily mileage, (4) condition of roads, (5) cost of gas, oil and repairs. Large trucks necessarily involve increased expenditures for operation. The cost of operation per unit of load, however, may be less with the large truck than with the small one. The operator whose prospective daily mileage will be unusually large must expect that his operating costs will be correspondingly large. Where the roads are smooth and hard, costs of operation will necessarily be much less than

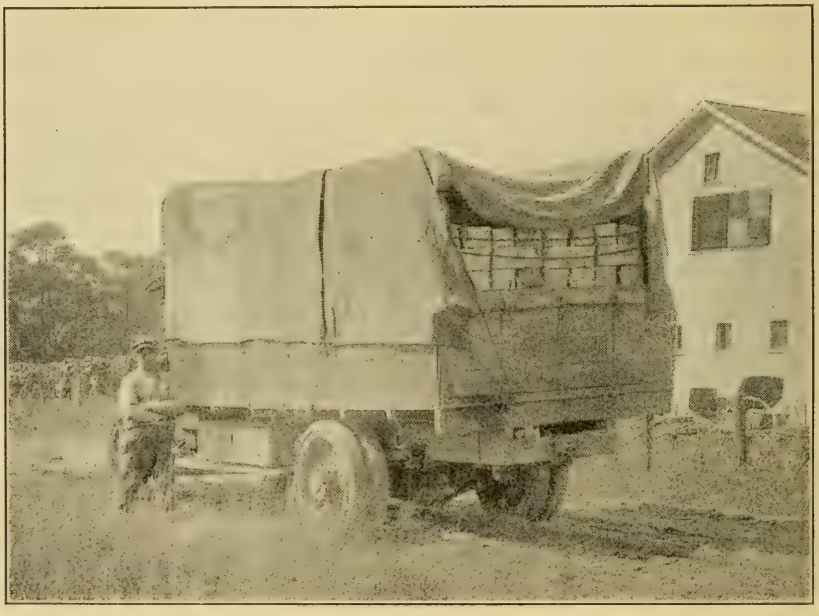


FIG. 3.—An open-top stake body, with loose canvas cover, carries a large load of grapes, but is not the best type of body for hauling perishable products.

where the roads are in a poor state of repair or so soft as to be nearly impassable at certain seasons of the year. Gasoline, oil and repair bills will vary in different sections of the country. It is impossible to generalize on these expenses at this point. The prospective operator must examine his local conditions, however, and adapt his ideas to the prevailing scale of prices.

In view of the fact that no two individuals operate motor trucks under identical conditions, it is necessary that there be some basis of calculation applicable under all conditions. Calculations bearing on costs of operating motor trucks are customarily based on the "ton-mile." This expression refers to the transportation of a one-ton load for a distance of one mile, or the equivalent thereof. The use of such

a basis is more nearly accurate than an estimation of costs on a mileage basis where no consideration is given to the load. It is obvious that the truck operating with no load, costs less per mile for operation than one that is loaded. The wise operator will keep this basis well in mind in considering his costs of doing business.

Few motor truck owners foresee all of the cost items which will arise under actual operating conditions. Still fewer farmers, who have embarked in the motor trucking industry either as an individual enterprise or as part of a community effort, have a clear understanding of what factors must be considered in estimating costs of motor truck operation. Attention will be directed, therefore, to some of the more important items of cost. No attempt has been made to arrange these items in order of importance.

GASOLINE, OIL AND GREASE.

The costs of gasoline, oil and grease represent the first expense items which naturally occur to the mind of the prospective operator. The customary error made in considering them is shown in a tendency to emphasize unduly this character of expense. The cost of gasoline, oil and grease, of course, is dependent directly upon local prices. In some districts prices for these supplies are invariably higher than in other districts, and the prospective operator will naturally investigate his local market. The cost of these supplies is of course heavier when the motor truck is loaded and is one of the variable items of expense in motor truck operation which can be estimated with considerable accuracy. Most operators have a fair idea of the consumption of gasoline, oil, and grease by their own trucks. Operators who have had some experience in truck operation will find little difficulty in arriving at a reasonably close estimate of these costs. The data collected by the Bureau of Markets show a very wide range in the gasoline mileage for trucks of different sizes under varying conditions. A study of about 60 typical motor routes showed a mileage of from 5 miles to 9 miles per gallon of gasoline for two-ton trucks, 4 miles to 6 miles for three-ton trucks, and 3 miles to 5 miles for five-ton trucks. These figures are not conclusive but will serve to indicate a range which was found under actual operating conditions.

DRIVERS' WAGES.

The wages paid drivers vary in different sections of the country and for trucks of different sizes. In districts where the cost of labor is high, operators have found it necessary to pay relatively high wages for drivers. Information gathered by the Bureau of Markets on a number of routes indicates a daily wage range of from $2.75 to $7.50. The higher wages were paid for expert drivers of heavy motor trucks in industrial regions where the general scale of wages was high. Drivers of small trucks in general farming districts were content with the

smaller wage. Where the truck owner expects to act as his own driver, it is only fair that a reasonable wage for this service be entered on the books before an attempt is made to calculate profits.

DEPRECIATION.

Depreciation as a feature of expense is little understood by the average small operator, and there is an almost universal tendency to accord too little consideration to this important item. Investigations disclose the fact that this constitutes one of the heaviest items of cost per mile of operation. Most operators who consider this item at all are inclined to set aside from 20 per cent to 33 1-3 per cent of the cost of the truck each year to cover depreciation. This is a very simple arrangement but it is not entirely a sound one. It is obvious that depreciation will be greatest on the truck which makes the greatest annual mileage. It will be seen, therefore, that unless the annual mileage, or prospective annual mileage, is considered, the preliminary estimate of depreciation is apt to be incorrect. Depreciation under actual working conditions varies considerably with different makes of trucks and is correspondingly less on better makes. It is impossible to set forth a formula which will enable the prospective purchaser of a motor truck to estimate in advance his depreciation with any considerable degree of accuracy. It will be necessary for each owner to consider carefully his own conditions and on the basis of past performance of trucks of the same size and make as his own, draw his own conclusions. The operator who is just considering the route will do well to study very seriously the importance of this item of cost. If he will tentatively estimate depreciation in terms of dollars and cents per year, estimate his prospective yearly mileage, and divide his annual depreciation cost by the annual mileage, he will be surprised at the cost of depreciation per mile of operation.

INTEREST ON INVESTMENT.

While interest on investment is a matter of controversy in corporation accounting there can be no doubt that the motor truck operator must give serious consideration to the fact that he will have invested considerable money in the motor truck that can not be used for other purposes. Most operators are content to estimate six per cent as a fair rate of interest per year, but few of them take into consideration the depreciating value of the truck. During its second year of operation, it is obvious that the motor turck is not worth as much as during its first year. For this reason, a charge of six per cent for interest on the purchase price of the car is not a just one during the second year of operation.

A simple formula has been devised by a conference of truck owners for calculating the average annual interest to be charged against a motor truck. This formula is as follows: $\frac{A+1}{A} \times \frac{C \times B}{2} =$

average yearly interest. In this formula A represents the estimated life of the truck in years under actual operating conditions; B represents the original investment; and C represents the rate of interest. To illustrate the use of this formula let it be assumed that a truck is purchased for $3000 which the operator estimates will last for 4 years under his operating conditions. Six per cent may be considered a fair rate of interest. Inserting the necessary values in the equation given above, we have: $\frac{4+1}{4} \times \frac{.06 \times \$3000}{2} = \$112.50$ (average yearly interest). The use of such a formula makes it possible to estimate, with a reasonable degree of accuracy, the amount which should be set aside each year as interest on the investment.

REPAIRS.

The regular repair bill, when coupled with the annual cost of overhauling, is often a serious one. The experience of motor truck operators in various sections of the country show that this is an important item of expense. Naturally it is impossible to make an advance estimate of these costs with any reasonable degree of accuracy. The annual repair bill will bear a practical relation to operating conditions. Where care is used in handling the truck, the cost of repairs will be much less than where no attempt is made to exercise reasonable supervision over operation. The cost of repairs increases with the age of the truck. Those operators who have purchased used equipment have found their repair bills relatively higher. Repairs during the first year of life of the new truck are not a very serious consideration. When the motor truck is in more or less continuous use throughout the year, it is usually laid up once each year and given a complete overhauling. The cost of this overhauling depends on the age of the truck, the care which it has received, and its size. Data collected by the Bureau of Markets show annual costs of overhauling ranging from about $100 to as high as $800 or $900. Those truck operators who make it a point to keep their trucks in a constant state of repair have relatively small charges to meet for annual overhauling. Those who operate their trucks as long as possible with no regular repairs must often face an extremely heavy charge for overhauling at the end of each year.

TIRES.

Tire cost is another heavy item of expense. This item varies directly with the use of the truck. Road conditions are a prime consideration in determining tire cost per mile of operation. It is often found that there is a very wide variation in tire cost of different trucks operating with varying loads and under changing conditions. Data in the possession of the Bureau of Markets show a range of tire costs of from one cent to four cents per mile where solid tires are used. These figures cover a large number of trucks of different sizes, operating with

different loads. They are offered as illustrative rather than as authoritative. It must be remembered that while the actual tire cost of the large truck heavily loaded may be relatively high per mile of operation, the cost per ton may be small, and in the final analysis the latter comparison is the only fair one. Where pneumatic tires have been used, it usually has been found that the actual tire cost is rather in excess of the cost where solid tires are used, but in such cases the annual depreciation and the cost of repairs are usually less.

GARAGE RENT

Garage rent is an item of expense which is often not incurred directly by the rural operator. Where the operator finds it necessary to rent garage space it is, of course, easy to calculate the cost. It is not so easy to make such an estimate, however, where no actual cash outlay is incurred. Where the operator is using garage facilities of his own, which might be valuable for other purposes, the rental value of these facilities should be entered on the books. Where no attempt is made to house the truck when not in use, the operator may save on garage cost only to lose a still greater amount due to increased depreciation.

TAXES, LICENSE AND INSURANCE.

Taxes and the costs of a license and insurance vary greatly in different states. The prospective owner of a motor truck should look into the matter in advance and be in a position to meet these liabilities as they come due. Insurance of various kinds must be considered. Theft, accident, and fire insurance should be taken out on the motor truck itself. Reliable operators now find it desirable to take out insurance covering the load which is being carried.

OVERHEAD EXPENSES.

The item of overhead expenses includes office rent, office equipment, clerical and other salaries, advertising, etc. They are often of minor importance to the farmer operator, but constitute a considerable expense for the larger operator who finds it necessary to maintain a business headquarters.

The above enumeration of operating costs may serve to call to the attention of some beginners in the field of motor truck transportation the need for carefully considering the business elements in advance of actual operation. The most common error of the beginner is to underestimate some of the cost items. Many beginners either underestimate or fail to estimate at all such an important item as depreciation. Such operators have been known to conduct their business for several months under the assumption that they were making money, only to find that their apparent net profit was being absorbed by the lessening value of their rolling stock. Other operators have been inclined to accept cost figures determined under widely different conditions, or

under conditions which were not all comparable to those in the operator's own territory. Few operators realize that costs are directly related to the plan of operation, and the final costs of operating a given route will depend almost entirely on the local conditions under which the route must be maintained.

SELECTION OF OPERATING EQUIPMENT.

The problem of selecting proper operating equipment is one that ordinarily is not given the consideration its importance deserves. Too few operators have a sufficient knowledge of the mechanical operation of motor vehicles, so that many a promising route has proven unprofitable because of improper or insufficient mechanical equipment. In making their first purchases, some operators rely exclusively upon the statements of sales agents for motor truck companies. Often this procedure has proven satisfactory in the long run because as a rule the sales agent is anxious to see that his customer is supplied with the próper equipment, so that other orders may be expected in the future. It will be well, however, for the beginner in this industry to confer with owners and operators of motor trucks in his vicinity, who will be able to give him unbiased and unprejudiced advice.

SIZE OF TRUCK.

The size of the truck to be purchased will, of course, depend very largely on the estimated tonnage to be hauled. Not only must the operator purchase trucks of sufficient size to care for the business at the outset, but he must plan for a normal increase in tonnage, so that at a later date he will not find it necessary to purchase other equipment more suited to his needs. It must be remembered that there is a very definite relationship between the size of the truck and its upkeep cost. The cost of operation per mile of a large truck is greater than is that of a small truck. If a large truck is purchased and the average load carried is well below the rated capacity of the truck, the operator will find that his cost per unit of load is high. On the other hand, where regular loads are uniformly heavy, the cost per unit of load is much less with the larger truck. One five-ton truck will transport a five-ton load much more economically than will two trucks of half that capacity. In some cases, consideration must be given to the character of the load to be hauled. If the load is perishable by nature and the truck is not loaded to capacity, the comparatively heavy springs of the larger trucks may cause a deterioration of the load. If the load promises to vary considerably during different periods of the year, it may be advisable to consider the use of a trailer in connection with a truck of smaller rated capacity than the maximum load. The trailer seems to have been successfully used by a large number of commercial operators, but the Bureau of Markets has no data regarding the advisability of using trailers when the load is uniformly greater than the rated capacity of the truck.

Road conditions bear a direct relation to the size of truck to be selected. Roads having a light surface or country roads having a soft surface may not permit the operation of heavy trucks. In some states bridges in rural districts have not been designed to care for heavy modern traffic, and in these districts it is necessary to use lighter vehicles. Some States and some municipalities have placed legal restrictions on the weight of rolling vehicles passing over the roads. In most cases these restrictions are so worded as practically to forbid the use of trucks whose gross tonnage when loaded exceeds a certain maximum. In other cases the load which trucks may carry depends upon the width of the tire equipment. The prospective operator should communicate with the Public Service Commission or such other body as may have jurisdiction over the operation of trucks in his territory and inform himself in advance as to legal restrictions covering the operation of trucks on the highways.

BODY EQUIPMENT.

The selection of body equipment must be based primarily upon the general character of the loads to be hauled. In rare cases where the goods are highly perishable or must be carefully protected from weather conditions, it may be necessary to use specially constructed bodies. Under ordinary conditions, however, the operator usually has his choice of several types, and his selection, as a rule, is based upon his requirements and the initial cost of the equipment.

Body equipment is usually secured from one of three sources. Bodies may be built locally, according to the ideas of the operator, and superimposed on the chassis when delivered; or, bodies of regulation design may be furnished by the manufacturer of the chassis as regular or special equipment. Some concerns specialize in building truck bodies according to regular or special designs and will furnish a body of any design submitted by the purchaser.

Certain basic considerations are necessary in the selection of body equipment. The prospective operator should have a fairly clear idea of the general nature of the commodities which he will be obliged to haul. He should estimate the bulk of his load as compared to its weight. If any appreciable proportion of the ordinary load is perishable, necessitating special protection from heat, cold, or rain, consideration should be given to this fact in the selection of a truck body. If the average load is to be composed of package freight, the truck body will be much different from the one used if regular loads are composed of commodities shipped in bulk.

Of the large number of body types, many are entirely unsuited to the needs of the ordinary operator of a rural motor freight route. However, attention may be directed to a few of the more common types of bodies. While no uniform names have been applied to these

general types, it is believed that the descriptions given herein will be sufficiently plain. The following are among the commonest types of truck bodies in use:

Stake body (open top).—This is a relatively cheap body, is easy to load, and is capable of carrying extra large loads of bulky goods. Because of its construction, it is adapted to a large variety of uses. It should be remembered, however, that because of the open top and the lack of protection on the sides, it offers little protection from the weather unless the load is well covered with canvas. It is not always easy to protect the load by means of a loose canvas cover, and for this reason, the open-top stake body is not as popular for rural hauling as is the next type mentioned.

Six or eight-post open-side body.—This body has a permanent waterproof top and, with the use of the customary side curtains, is a very popular and adaptable type. It is comparatively light in weight and offers much better protection to the load than does the open-top body. In winter, however, it is not easy to heat where it is necessary to protect a perishable load. This type of body is the most popular because of its light weight, general adaptability and cheapness.

Straight-side closed body (or van body).—This type offers the best possible protection to the load if it is so designed as to insure proper ventilation. It is possible to seal such bodies so as to protect the load from pilferage, this being a decided advantage where the load is a valuable one. The closed body is heavy, thus increasing the cost of truck operation and is initially expensive. It is not so easily loaded as the open-top, but may be used for hauling almost anything that is offered.

Open express body.—This body resembles the ordinary farm wagon, has no stakes at the sides, and is uncovered. It is well adapted for hauling milk or products shipped in bulk, such as grain. It is fairly cheap in price, but offers little or no protection from the weather. It is not adapted for hauling large loads of light bulky goods, and except for special purposes, should not be selected by the average operator.

Dump body.—This is an unusual type for rural hauling and is not adapted to a wide range of uses. It is heavy, unsatisfactory, and expensive for general rural hauling. It might be used advantageously for handling bulk grain or similar products, but should be selected only for special uses.

In general, the selection of body equipment is a problem which solves itself if proper forethought is given to the character of the business. There are many special variations from the general types of body mentioned above. If the prospective load promises to be heavy in proportion to its volume, the body need not be large. If, as is usual with miscellaneous farm loads, bulky loads may be carried, it is important that the body be of sufficient size to accommodate a capacity load for the truck.

TIRE EQUIPMENT.

It is important that due consideration be given to the selection of tires, in view of the fact that tire cost is one of the heavy items in motor hauling. There are two general types of truck tires in use—the solid and the pneumatic. There is a third type, the cushion tire, which has a limited use at the present time, but by far the greater proportion of motor trucks are equipped with either solid or pneumatic tires. The solid tire is more commonly used because it is more adaptable and cheaper than the pneumatic, does not suffer from blowouts or punctures, and stands up well on bad roads and under very heavy loads. The pneumatic tire for truck use is a recent development, and there is less known about the possibilities of pneumatic tires for heavy loads than is known concerning the solid tires. Advocates of the pneumatic tire claim lessened vibration for truck and load, greater speed, and increased gasoline mileage. Where speed is essential, the pneumatic tire should be considered carefully. Where economy is the prime factor, the question is debatable. The majority of practical operators, however, favor the solid tire. No attempt will be made in this publication to issue an authoritative statement regarding the merits of the two types.

The size of tires should depend upon two factors: (1) The weight of the ordinary load, and, (2) the character of the road. Under-size tires are not only uneconomical, but are injurious to the roads over which they travel. Over-size tires are initially expensive and, if the load is ordinarily light, are unnecessary. With slightly soft roads or extra heavy loads, over-size tires may be desirable. In general, the recommendations of the manufacturing company or its agents are more reliable than the judgment of an inexperienced operator. It is well for the prospective purchaser to consult local tire agencies in considering new equipment. It should be remembered that the agent can offer authoritative advice only when he is fully informed as to operating conditions, and when such advice is asked, the operator should state his case fully.

DETERMINATION OF RATES.

The Bureau of Markets has received many inquiries indicating that the question of a basis for the determination of motor freight or express rates is not clearly understood even by experienced operators. The operator of a regular commercial rural route (as distinguished from the farmer operating a truck for himself and a few of his neighbors) has little to guide him except the rates of other operators. As a rule, these are not sufficiently uniform to form an adequate or just basis of comparison. Many operators have established their rates on the basis of "what the traffic will bear." Naturally, rates so established have varied in different localities and for different com-

modities. Many operators have initiated service with rates so high as to drive profitable business away; others have gone to the other extreme and in their desire to attract business, have failed to give due consideration to operating costs and have lost heavily because their rates were too low. There are several factors which should be considered in the establishment of rates in any district. The value and the fragility of the load bear a direct relationship to the rate which should be charged. Very valuable or fragile loads involve a greater risk on the part of the carrier, and the tariff for the carriage of such goods should be sufficiently high to offset the risk involved. Where insurance is carried, this must be considered as an item of cost in calculating the rate to be charged. The length of the haul is naturally another prime consideration. It is comparatively easy to consider this item, as the cost, as a rule, varies directly with the distance. Road conditions also directly affect operating costs and, hence, must be considered in establishing rates. Where the roads are good, operating costs are low and charges for transportation can be lessened accordingly. Where poor roads are encountered, the additional cost must be featured in the rate schedule. The perishability and the bulk of the load also should be considered. The transportation of highly perishable goods involves a risk which must be paid for. Where goods are extremely light and bulky, it must be remembered that the truck when fully loaded may not carry its capacity in weight; hence, operating costs will be increased per pound, and this must be reflected in the rates. Some operators fail to consider competitive rates by railroad, electric line, boat line or other motor truck lines. It goes without saying that a profitable business will not be secured if rates are not in line with those of other carriers. It should be remembered, therefore, that careful consideration must be given to rates charged by other carriers. The class of service rendered will also directly affect the rate. Where complete delivery is made from the door of the shipper to the door of the consignee and service is rendered which is not duplicated by the railroad, the additional service must be considered in fixing the rate. In many cases rural motor routes make delivery of goods much more quickly than does the railroad, and where time in transit is a consideration, the additional value of such prompt service is to be considered. Return loads bear a direct relationship to the primary rate in that the operator who is assured of a profitable return load will be enabled to reduce his charges because of lessened cost per ton-mile.

There are many other minor considerations to be gone over by the beginner in the motor truck industry, but those mentioned above are basic in nature. Some operators catering to a business which ordinarily would go by freight have established rates which compare directly with freight rates. Most operators do an express business and base their rates accordingly. In some districts, in the effort to establish a

fair rate, motor operators have added ordinary freight and express rates together and divided the sum by two. This is decidedly an unsound and unscientific method for the determination of such rates but represents an earnest effort to place the motor truck on a rate basis comparable with that of the chief competing carriers. Practically no rates have been established on the basis of cost plus a reason-

FIG. 4.—The farmers of Harford County, Maryland, operate a motor truck route for themselves with entire success. This is one of their roadside loading platforms, to which the farmer brings his milk by a short haul, and the truck takes it to Baltimore.

able profit. This is easy to understand because cost of operation is not well understood by most operators, and very few have any authoritative information in this connection.

The satisfactory rate must be one which is low enough to attract business and high enough to offer a reasonable profit to the operator. Where conditions do not permit the establishment of such a rate, care should be exercised in starting a route. As the rural motor business becomes more firmly established in various districts, the practical experience of operators will serve to indicate fair rate bases. In the meantime, it will be necessary for each operator to solve his own problems on the basis of local conditions in his district, paying particular attention to the features indicated in this bulletin.

COLLECTION AND DELIVERY ARRANGEMENTS.

It must be remembered that that two of the principal advantages of the motor truck, namely, lessened handling of goods in transit, and speedier transfer, are lost if satisfactory collection and delivery ar-

rangements are not perfected. It may be well to mention and to discuss briefly collection methods in vogue among practical operators in various districts. It should be stated in advance that no system worthy of exact duplication has been found by investigators of the Bureau of Markets in studying the business arrangements of a large number of operators in various sections of the country. Collection and delivery arrangements, as a rule, have grown up gradually with the business and in many cases are cumbersome, unsystematic and expensive. The following common methods are suggested to prospective operators and may serve to stimulate thought in the direction of a more systematic handling of this phase of the motor-truck business.

FARM-TO-FARM COLLECTION.

Farm-to-farm collection usually is adopted on short rural routes where comparatively few stops are ordinarily made. Where heavy trucks are used, this method of collection is not entirely feasible because of the increased cost of operation. Where light trucks are used, however, it has proven reasonably satisfactory. One advantage of this method of collection is that the business of the operator is constantly brought to the attention of shippers along his route, and tonnage is thus secured which might otherwise move by different means. As has been indicated, farm-door collection is costly in time and gasoline, and the successful operator must charge rates which reflect his increased costs. In practically all instances it is not advisable to deviate far from the main highway in collecting the load. Most operators who gather produce at the farm door refuse to go far from the regular route over which they ordinarily travel.

CROSS ROADS COLLECTION.

Collection at cross roads involves fewer stops than are made when the truck collects goods at each farmhouse and commends itself to the businesslike operator. Such an arrangement is convenient both for the patrons and for the driver. Of course, this method of collecting goods makes it necessary for shippers to bring their goods to the cross roads, but in most cases this can readily be done with the facilities at hand on the farm. This method of collection is very popular in various sections of the country and probably will remain a permanent feature of the rural motor hauling business in many communities. In general, it affords a maximum of service and convenience for a minimum of cost and comes nearer to fulfilling the ideal condition than any other method now in vogue.

CENTRAL ASSEMBLING POINTS.

Very few rural routes have their business systematized to the extent of arranging for central assembling points where shippers may bring their goods for transportation to the city. Where proper arrangements

are made, this method of collecting has much to commend it to the business-like operator. Where trucks of large capacity are used, the establishment of a few central assembling points will save operating the heavy truck in out-of-the-way districts and will materially lessen the cost of service to shippers. Two general methods may be used by the operator who desires to utilize central assembling points. The first method is to have the shippers bring their own products to the nearest central assembling point. In this respect, this system differs from the cross roads pick-up system only in that the number of stops for collecting loads are fewer. The second method is to arrange to have a lighter auxiliary truck to assemble all goods in a given district for loading on the heavy truck at the central assembling point or points. On one important demonstration route fostered by the Bureau of Markets, the first method of collection, *i. e.,* with shippers bringing their own products to the central assembling point, was adopted. Later it was found more satisfactory to arrange for an auxiliary pick-up service, utilizing a lighter truck to pick up goods for assembling at central points to be loaded on the heavy truck for transportation to market. It seems altogether likely that with the enlargement of rural motor service and the consequent systematizing of business, the central assembling point for gathering the load will grow in favor and importance.

Whatever method of collection is adopted by the operator, it is advantageous to have a small loading platform at each point where goods are to be picked up. This loading platform should be the same height from the ground as the floor of the truck, so as to facilitate the loading of the goods on the truck. Such platforms are inexpensive and save much time and trouble when business is flourishing.

DELIVERY METHODS.

Methods of making delivery vary as greatly as do methods of gathering the load. These, again, are determined by the class of business handled, the type of the load, and the size and nature of individual consignments. It is impossible to generalize on the subject in a publication of this kind, because satisfactory methods must be worked out on the ground so as to permit any changes which may be caused by local conditions. In many cases, and particularly by small operators, delivery is made directly to the door of the consignee. Where the business is on a large scale and is fairly well established, the operator often assesses an extra charge for direct delivery of packages which do not return a minimum gross revenue. This extra charge for complete delivery of small shipments varies from 25 cents to $2.00 per package. One large motor truck company operating in New York

City delivers free of charge to any point below 120th Street individual consignments returning a gross revenue of $1.00 or more. Packages returning a lesser revenue are delivered free to the downtown terminal of the company only ,an extra charge being assessed for complete delivery to the consignee.

Some rural operators have established city depots for the collection and delivery of goods. Commodities picked up at various points in the country are brought to these depots in the city. The consignee then calls for the goods, or a light truck for city use effects a complete delivery. In order, however, to utilize profitably the services of an auxiliary truck for city delivery, it is necessary for the operator to have a sufficient volume of business to justify the maintenance of such a vehicle. The establishment of a central terminal would solve the city delivery problems of the small operator. The central terminal plan is discussed in detail in a subsequent portion of this bulletin.

Most operators have found it more satisfactory to make complete delivery to the consignee, assessing a minimum charge on small shipments sufficient to cover complete service. Such an arrangement is almost always more satisfactory to the patrons. Offering complete delivery also emphasizes one of the desirable features of motor truck service, namely, complete transportation service to the door of the consignee with a minimum of handling in transit.

COLLECTION OF MONEY.

Nothing has yet been said concerning the collection of moneys. With the small operator, particularly the farmer-operator, the collection of money is usually a very informal matter. Cash is collected either from the shipper or from the consignee, according to previous understanding. Sometimes even the formality of a receipt is dispensed with. Where regular patrons furnish a dependable load, arrangements are often made for rendering weekly or monthly bills to these shippers. This necessitates more complete and careful bookkeeping on the part of the operator, but is more desirable from point of view of the regular patron, who may not always have the exact change to hand to the truck driver when he calls for or delivers the goods. In any event, financial transactions should be marked by the passing of documents, whether these be receipts, receipted bills of lading, or other evidence that money has changed hands.

KEEPING COST RECORDS.

Having established a motor route, it is imperative that adequate records be kept. In an investigation covering over 60 routes, the Bureau of Markets found numerous instances where operators who thought they were making a profit as a matter of fact were gradually using up the original investment for current expenses. It is obvious that a man who has no clear idea of his costs of operation cannot

Form M. T. 1. **U. S. DEPT. OF AGRICULTURE, BUREAU OF MARKETS.**

DRIVER'S DAILY REPORT CARD.

Date.....*191*

Truck No.....

OUTBOUND.

Leave.....*at*.....*A. M.* / *P. M.*

Arrive.....*at*.....*A. M.* / *P. M.*

INBOUND.

Leave.....*at*.....*A. M.* / *P. M.*

Arrive.....*at*.....*A. M.* / *P. M.*

Total mileage for day.....

Total load outbound.....*lbs.*

Total load inbound.....*lbs.*

No. of delivery or pick-up stops.....

Hours with helper.....*cost*.....

Gasoline used.....*gals. @*.....*c*

Oil used.....*pints @*.....*c*

Grease used.....*lbs. @*.....*c*

Cost of repairs (if any).....

Time laid up for repairs.....*hrs.*

Ferries and tolls.....

Hours not running.....*Reason*.....

.....

Tires Changed — *Front* — *Right*..... / *Left*..... ; *Rear* — *Right*..... / *Left*.....

Reasons for removal.....

.....

Condition of roads.....

Remarks.....

.....

Driver

institute changes in business management which may be necessary or desirable from time to time. Investigators have found records of every sort, ranging from informal notes in a pocket note-book to elaborate auditing and accounting systems. The small operator is the chief offender in this connection, because he understands little of business records and is not disposed to add to his daily burden of work; elaborate truck cost systems seem too complicated to him. The Bureau of Markets has placed some cost accounting forms with several

co-operating motor truck operators, for the purpose of gathering data on costs of maintenance and operation. The forms may not have been ideal for the purpose, but a number of operators found, to their surprise, that keeping complete and accurate records was not the impossible task which it appeared at first. It is not desirable to indicate a complete system of accounts in this bulletin, but the "Driver's Daily Report Card" on page 24 should prove a satisfactory basis for any permanent cost recording system. This form has been used successfully by the Bureau of Markets in cooperating with a large number of rural truck operators. It may not prove satisfactory under all conditions, but it is offered as a suggestion to those operators who desire to secure regular reports from their drivers each day.

The information conveyed by the driver's daily report card, coupled with that in the hands of the owner of the truck, can be transferred to permanent records of a type desirable to the owner. Whatever system is adopted, this one fact must be kept in mind, that periodically it should be possible to balance all receipts against all costs, to determine profit and loss. Any system which will enable the owner to do this without too much effort can be used.

UTILIZATION OF THE FARM TRUCK.

There are an increasing number of farm trucks, particularly on farms adjacent to large cities. Not all these trucks are loaded to full capacity on their periodical trips to the city. Few farmers have their business so arranged as to permit the use of the truck to its maximum capacity regularly. Many farmers need a motor truck, in spite of the fact that they are unable to use it to capacity on a regular basis. Such farmers have gradually begun to haul a part or all of their neighbors' products to market and in some cases, this practice has led to the establishment of a regular route. Where the business has warranted, farmer-owners have increased their facilities for hauling goods, and many substantial rural routes are the outgrowth of the individual farm haul. Some farmers have been enabled to purchase trucks because of the fact that their own business, coupled with that of their neighbors', has been sufficient to warrant the purchase of a truck. It cannot be doubted that the motor truck as a community institution will be increasingly important. The farmer who is hauling for his neighbors is performing a useful function. Such practice is susceptible of expansion and the farmer-operator can usually offer attractive rates to his neighbors. Farmers needing a motor truck for part time service would do well to investigate the possibilities of business in their neighborhoods. It has been found in several instances that co-operative action has proven feasible and the subsequent formation of a farmer's association has resulted. This feature of the motor hauling business is distinctly worth serious consideration by those who may be interested.

THE RETURN OR SUPPLEMENTARY LOAD.

The success or failure of many routes has depended largely on the ability of the truck owner to operate his truck at all times with loads of sufficient capacity to return at least a moderate profit. Too many routes have been started where a good one-way business was secured and the operator felt justified in returning with empty trucks. It is unsafe to generalize, but it may be definitely stated at this point that practically no route has ever been successful which has depended for its existence on a one-way load. Where truck operators have been farsighted enough to provide for even a partial load on the return trip, the business has offered a fair promise for success. Many of the more successful rural motor routes now in existence have achieved their success because of the fact that before operations commenced, the return load was arranged for. Those who contemplate embarking in the rural hauling business, would do well to look into the possibilities of securing contracts for supplementary or return loads, even though such contracts promise to pay little more than the cost of operating the truck. Most rural operators return from the city bringing back loads of general merchandise for country stores or supplies for farmers along the way. Where the operator makes it plain in advance that he proposes to cater to the merchant or farmer who makes his purchases in the city, he finds himself supported by a more or less permanent class of business which, while possibly not showing a very high net profit, makes it possible for him to handle his other business on a closer margin and with greater net profit to himself.

In many districts there are certain periods during which there is a heavy local demand for transportation facilities. Truck owners have taken advantage of this condition in many districts and have greatly improved the financial condition of their business. Special contracts for hauling outside of schedule hours are often exceedingly profitable and sometimes make it possible for the regular route to be operated regularly.

In general, it may be said that too few operators realize the importance of utilizing their trucks to full capacity at all times, and many failures can be traced to the fact that operators have tried to secure all of their profits from a one-way business.

THE CENTRAL TERMINAL.

A noticeable feature of the operation of rural motor routes into and out of various cities, which came under the observation of investigators of the Bureau of Markets, was the lack of central receiving or distributing stations. In each city the operators maintained their own individual stations and each carried on his business independent of the business of others.

Where a number of independent routes have their terminals in a given city, the over-head expenses incident to the maintenance of individual terminal stations are multiplied many times, while the advantages of a central terminal are lost altogether. These advantages are very real. In the first place, the establishment of a central terminal for a group of motor routes is in itself an advertisement of the service

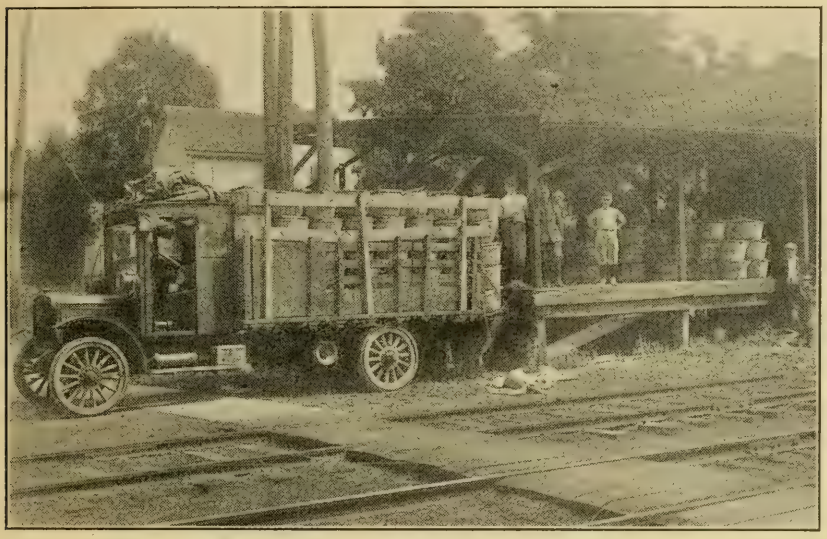


FIG. 5.—The peas in this load will go directly by motor truck to the dealer at the market 15 miles away and arrive in fresh condition. This is a concentration platform, to which perishable products are brought from all directions.

in that the attention of the shipping public is directed toward the possibilities of motor transportation. The use of the central terminal encourages and facilitates the transfer of goods originating on one route and destined to some point on another route. The problem of city delivery, which is a serious one in large cities, can be solved by the establishment of a common delivery service, supported by all operators who use the central terminal, and obviating the need for operating heavy trucks to scattered points in congested districts for the purpose of delivering relatively small consignments. Last, but not least, the use of the central terminal would effect some very material economies on such items as office rental, clerical assistance, telephone charges, heat, light, and related expenses ordinarily incurred with the maintenance of terminal facilities.

In view of these facts, the central city terminal is recommended to the consideration of groups of motor truck operators who maintain individual terminals. A central terminal company can possibly best be organized as a joint stock corporation. Expenses may be pro-rated on the basis of the volume of business transacted through the terminal

by each contributor to the enterprise. It is realized that competitive influences might offer obstacles to the plan indicated, but the operation of such a terminal as the one herein described could be made independent of ordinary competitive factors.

If the motor truck as a freight or express carrier is to compete successfully with other carriers who have occupied the field for a longer time, the business must be organized on a basis which will compare favorably with the business of older and better established carriers. Central terminal facilities are just as necessary for motor routes as for other common carriers.

BUSINESS ARRANGEMENTS FOR STABILIZING THE BUSINESS OF THE RURAL MOTOR OPERATOR.

Mention has previously been made of desirable business features which should be incorporated in the practices of all rural truck operators. Among those mentioned were the determination of fair rate bases, the keeping of adequate cost and operating records, and the maintenance of dependable schedules. It is desired, in this connection, to direct attention to additional features which, if incorporated in the business of the rural motor operator, probably would do more to place the industry on a par with rail carriers than would any other changes which could be made. Reference is made to the use of a Standard Bill of Lading and the adoption of adequate insurance coverage.

THE STANDARD BILL OF LADING.

A satisfactory bill of lading should bind the operator to the obligations of a common carrier and should set forth the extent of his liability very clearly. It should be designed so as to permit the transfer of goods from one carrier to another. In addition to the features of the ordinary railroad bill of lading, it should include some of the features of the invoice and the expense bill so as to obviate the need for a large number of forms for a relatively small business. The accompanying form for a Standard Bill of Lading is offered as a suggestion to operators who desire to standardize their shipping documents. It will be noted that it is modeled, in a general way, on the ordinary "Uniform Bill of Lading," used by the railroads. Certain important changes have been made, however, to conform to the needs of the motor transportation business. The form contains certain items not ordinarily incorporated in the regular bill of lading, such as statements of value and shipping charges. While these are not a part of the ordinary bill of lading, it seems best to refer to the specimen document as a bill of lading, although it also includes the essentials of the invoice and the expense bill. It should be remembered that laws governing the business of common carriers vary in different States and in some cases it may be necessary to modify certain provisions of the suggested bill of lading to accord with existing laws.

CONDITIONS.

SECTION 1. The carrier or party in possession of any of the property herein described shall be liable for any loss thereof, or damage thereto, to the extent of the value declared in this bill of lading, except as herein after provided.

No carrier or party in possession of any of the property herein described shall be liable for any loss thereof or damage thereto or delay caused by the act of God, the public enemy, quarantine, or the authority of law, or the act or default of the shipper or the owner, or for difference in weights of grain, seeed or other commodities caused by natural shrinkage or discrepancies in public weights; and, except in cases of the negligence of this company or its agents, it shall not be liable for loss, damage or delay occurring while the property is stopped and held in transit at the request of the shipper, owner, or party entitled to make such requests, or resulting from default or vice in the property, or strikes, or the death, injury or escape of live freight.

SEC. 2. In issuing this bill of lading this company agrees to transport only over its own line, and except as otherwise provided by law, acts only as agent with respect to the portion of the route beyond its own line.

No carrier shall be liable for loss, damage or injury not occurring on its own route, or its portion of the through route, nor after said property has been delivered to the next carrier, except as such liability is or may be imposed by law, but nothing contained in this bill of lading shall be deemed to exempt the initial carrier from any such liability so imposed.

SEC. 3. No carrier is bound to transport said property by any particular truck, or in time for any particular market, or otherwise than with reasonable despatch, unless by specific agreement endorsed hereon. Every carrier shall have the right in case of physical necessity to forward property by any route or means between the point of shipment and the point of destination, but if such diversion shall be made the liability shall remain as if the entire carriage were made by the receiving carrier.

In consideration of the value herein declared being used as a basis for determining the rate to be charged, the amount of any loss or damage for which any carrier is liable shall be computed on the basis of such declared value of the property as herein stated under this bill of lading, including freight charges if paid. Except, in case the actual cash market value of the goods carried shall be less than the declared value, then settlement shall be made on the basis of actual cash market value on the date of shipment, but the shipper shall in no case be entitled, after a false declaration of value, to any refund of charges made.

Claims for loss, damage or delay must be made in writing to the originating or delivering carrier within thirty days after delivery of the property, or in case of failure to make delivery, then within thirty days after a reasonable time for the delivery has elapsed; and suits for loss, damage or delay shall be instituted only within two years and one day after delivery of the property, or in case of failure to make delivery, then within two years and one day after a reasonable time for delivery has elapsed.

SEC. 4. No carrier will carry or be liable in any way for any documents, specie or for any articles of extraordinary value unless a special agreement to do so and a stipulated value of the articles are endorsed hereon.

SEC. 5. Property not removed by the party entitled to receive it within forty-eight hours (exclusive of legal holidays) after notice of its arrival has been duly sent or given, as regards goods consigned to the terminal of the carrier, may be held at such terminal subject to a reasonable charge for storage, and the liability of this company shall be that of warehousemen only; or if such goods are herein consigned for delivery to a specified address other than the terminal of this company, the liability as common carrier shall terminate upon tender for delivery at the sidewalk or receiving platform of the consignee, and if the goods are not accepted on such tender, they shall be returned at the expense of the owner to the terminal of this company and held there subject to a reasonable charge for storage, or at the option of this company removed to and stored in a public or licensed warehouse at the cost of the owner and there held at the owner's risk and without liability of the carrier and subject to a lien for all freight and other lawful charges, including a reasonable charge for storage.

The carrier may make a reasonable charge for the detention for loading or unloading of any truck for a time in excess of thirty minutes exclusive of actual time consumed in such loading or unloading, and may add such charge to all other charges hereunder and shall hold such property subject to a lien therefor.

SEC. 6. Every party, whether principal or agent, shipping explosives or other dangerous goods without previous full written disclosure to the carrier of their nature and having the same expressly endrosed hereon, shall be liable for all loss or damage caused thereby and such goods may be warehoused at owner's risk and expense or destroyed without compensation.

SEC. 7. The owner, or consignee, shall pay the freight and all other lawful charges accruing on said property, and if required shall pay the same before delivery. If, upon inspection, it is ascertained that the articles shipped are not those described in this bill of lading, the transportation charges must be paid upon the articles actually shipped.

If any C. O. D. is not paid within thirty days after notice of non-delivery has been mailed to the shipper, the carrier may, at its option, return the property to the consignor.

SEC. 8. Any alteration, addition, or erasure in this bill of lading which shall be made without an endorsement thereof hereon, signed by the agent of the carrier issuing this bill of lading, shall be without effect, and this bill of lading shall be enforcible according to its original tenor.

STANDARD BILL OF LADING.

.....Company

Shippers' No. .....

Straight Bill of Lading—Original—Not Negotiable.

Agent's No. .....

RECEIVED, Subject to tariffs in effect on the date of issue of this original Bill of Lading, the property described below in apparent good order except as noted (contents and condition of contents of packages unknown), marked, consigned, and destined as indicated below, which said company agrees to carry to its usual place of delivery at said destination. It is mutually agreed, as to each carrier of any or all of said property over all or any portion of said route to destination and as to each party at any time interested in all or any of said property, that every service to be performed hereunder shall be subject to all the conditions, whether printed or written, herein contained (including conditions on back hereof), and which are agreed to by the shipper and accepted for himself and his assigns.

Date, ...191.....

From.....

Address of consignor at..... { Terminal of this company. / Store door of consignor } { Strike out one / not used. }

Consigned to .....

Address..... City of ..... State of .....

For delivery to { Terminal of this company at / Store door of consignee at / Address above given. } { Strike out delivery / not desired. } .....

Route ..... Truck No. .....

No. Packages.	Description of article.	Value of article.	Weight or bulk subject to correction.	Shipping charges.	War tax.

If charges are to be prepaid write or stamp here "To be Prepaid"

Received $..... to apply in prepayment of the charges on the property described hereon

Agent or Cashier

If charges are to be collect, write or stamp here "Charges Collect"

Where shipment is billed C. O. D. insert here amount to be collected on delivery (exclusive of shipping charges).

Collect $.....

The declared or released value of which is $.....

(If value declared is greater than 50 cents per pound, insurance at the tariff rate in effect to be added to charges.)

.....Shipper .....Agent

Per..... Per.....

(This Bill of Lading to be signed by the shipper and agent of carrier issuing same.)

(OVER)

INSURANCE ON LOADS CARRIED BY MOTOR TRUCKS.

The visible assets of the railroad, express company, or boat line offer assurance to shippers that the carrier is financially able to settle claims for damage to goods in transit. The operator of a motor route, particularly the small rural operator, can offer no such tangible evidence of his ability to meet obligations arising out of damages to goods intrusted to his care. Until he can offer protection to his patrons, the motor operator must labor under a handicap. The obvious solution of the problem is to obtain adequate insurance coverage. Such insurance should be for the full value of goods intrusted for shipment to the operator. The policy should cover all ordinary risks. Premiums should be paid by the operator from revenues derived from transportation charges, unless the value of the goods shipped exceeds a set maximum.

Bearing these facts in mind, the following are offered as suggestions for provisions to be incorporated in a satisfactory policy:

Provisions to be Incorporated in Policies Covering Shipments by Motor Truck.

1. For account of.....as assured, or for account of whom it may concern, but warranted not to cover the interest of any alien enemies, including such persons, co-partnerships or corporations as now, or may hereafter appear in any Enemy Trading List issued by the War Trade Board of the United States of America.

2. Loss, if any, payable to the assured or order.

3. On all kinds of lawful goods and merchandise of every description held in their custody as warehousemen and forwarders, but only while contained in or on the following named and numbered automobile trucks. Whenever necessary and for such periods of time as shall be necessary, the assured shall be privileged to substitute any motor truck or motor trucks for those herein specified provided the details of the proposed substitution are reported to the assurers in advance and an additional premium paid if required.

* * * * * *

4. It is the purpose of this insurance to indemnify the assured to the amounts which they are obliged to pay on such goods or merchandise by reason of loss or damage only by (1) fire, including lightning and self ignition; (2) accidental collision of the motor truck with any other vehicle or object, moving or stationary; (3) overturning or skidding of the truck; (4) collapse of bridges; (5) perils of the seas, lakes, rivers or inland waters, only while on ferries or transfers; (6) theft of an entire shipping package or of over 5% of shipments made in bulk, but excluding all pilferage; and excluding the theft by any employee of the assured, or the shipper or his employee, or the consignee or his employees; also excluding all theft of merchandise accepted for delivery within the limits of the city, town or village in which the goods are received for shipment.

5. Valued at amounts declared by the shipper to the transportation company, but not exceeding actual invoice value or, in the absence of invoice, the cash market value at time and place of shipment. In the event of the amount declared being less than the invoice or cash market value, as above, any partial loss shall be adjusted in proportion as the value declared bears to the invoice or market value.

6. It is understood and agreed that the assured shall keep a record of all shipments covered hereunder, showing shipping points, destination and value of each shipment, which record shall be made prior to shipment. It is also expressly understood and agreed that no insurance shall be in effect for which record is not entered on such forms as shall be prescribed by the assurer. All shipments to be reported to the assurers, or their appointed agents, at the end of each.....and premium payable monthly at the rate of..... per hundred dollars.

7. This policy shall not be vitiated by any unintentional error in description of route or interest, or by deviation, provided the same be communicated to the assurers as soon as known to the assured and an additional premium paid if required.

8. This policy to attach and cover on all shipments made on and after noon of.....

9. If at the happening of any casualty, the assured or owner of the goods has any other insurance, identical with or similar to the terms of this policy, whether prior or subsequent thereto in date, or simultaneous with this insurance, then these assurers shall not be liable under this policy for a greater proportion of any amount of the property insured than the amount hereby insured shall bear to the whole insurance in effect, whether valid or not.

10. It is also agreed that the assured in claiming and accepting payment for any loss, damage or expense under this policy, thereby and by that act assigns and transfers to these assurers all right to claim for such loss, damage or expense against any person or persons, town or corporation or any government, and if so requested by these assurers shall prosecute therefor at the charge and for the account of these assurers, to the extent of the amount of the loss, damage or expense, and the attendant expenses of recovery paid and incurred by these assurers on account of said loss, damage or expense, or for the recovery of the same, shall be a lien upon such property hereby insured and recoverable against the assured.

11. It is mutually agreed that the acts of either party, or their agents, in securing, preserving, or recovering the property insured or any part thereof shall not be considered as prejudicial to the interest of either party as set forth in this policy. The use of general terms, or of anything less than a distinct, specified agreement clearly expressed and endorsed in this policy shall not be construed as a waiver of any printed or written conditions or restrictions herein contained.

12. This policy can be canceled at any time at the request of the assured or by the assurers by giving notice in writing at least fifteen days before such cancellation shall be effective.

It will be noted that in using the standard bill of lading, the operator does not assume greater liabilities than those imposed by law on common carriers. Adequate insurance coverage, in turn, will protect the operator who assumes such liabilities. The reporting form of policy outlined above is probably the best form for the average operator in that all goods, while in his possession, are insured for full market value and settlement is made on that basis. The reports referred to in Section 6 of the above policy provisions would be nothing more elaborate than carbon copies of all bills of lading issued by the carrier who takes out this form of insurance coverage. Should State legislation

covering the business of insurance companies be in contravention of any of the suggested policy provisions, it will be necessary to modify the language of these provisions to accord with the statutes.

The use of the standard bill of lading and the adoption of the fullest form of insurance coverage are strongly recommended even to the small operator. Most operators will prefer to offer free insurance to the shipper on all goods valued below a certain maximum. It is suggested that a fair maximum for free insurance is about 50 cents per pound. When goods are valued at more than 50 cents per pound the shipper should, in addition to the regular shipping charge, be obliged to pay for the insurance coverage on the valuation in excess of 50 cents per pound. A scrutiny of the clause near the bottom of the standard bill of lading will make this point clear to the reader.

Only by the adoption of modern business methods can the future of the motor express business be assured. Many operators will hesitate to adopt the two important features, which have just been discussed, because they will fear complications in their business and the assumption of too great a burden of detailed clerical work. Business-like operators, who have given these features a thorough trial, have been surprised at the ease with which they have been able to accommodate their business to these changes. The small operator will find that the slight extra burden of work which he is assuming will be more than paid for in the increased business coming from patrons who are confident that any losses will be promptly and properly adjusted.

LIMITING FACTORS.

The chief factor limiting development in the field of rural motor hauling is the cost of operation as compared with that of railroads, electric lines, and boat lines. Cost of operation offers a problem which can only partially be solved by the operator. Careful attention to effecting economies may offset this limiting feature to some extent, but in the main the operator can not change his costs of operation to a very marked degree. This means that he must plan his business so that in competing with other carriers he is not working on an unequal basis. He must cater to a class of business which will pay a small additional premium for better service. To supplement this he must offer a speedier, more dependable or more complete service. For instance, many operators are successfully competing with other carriers whose basic expenses are lower because goods are picked up at the door of the shipper and unloaded at the door of the consignee with a minimum of handling in transit.

The second important limit to the extension of rural motor hauling is the condition of the average country highways. Road conditions bear a direct relation to operating costs. In extreme cases bad roads may prevent the use of motor trucks at all. In other and more com-

mon cases, poor roads may cause operating costs to be so high and truck operation so uncertain that the business is foredoomed to failure.

A third limitation to rural motor transportation, which has come to light under actual operating conditions, has to do with the financial responsibilities of the carriers. This feature has been thoroughly discussed in the paragraphs referring to the use of a standard bill of lading and the securing of adequate insurance coverage. The limitation is one which need cause no fear to the business-like operator who is willing to make the necessary changes in his business so that he may be on a par with other carriers.

The limitations herein mentioned must be carefully considered because they are real factors in actual practice. All can be met and solved by the business-like operator. It is to be expected that they will be solved as a better knowledge of the rural motor business is obtained and the possibilities of this form of transportation become more apparent both to the operator and to the prospective shipper.

CONCLUSIONS.

The foregoing discussion, although general in character, has been an attempt to bring forth one thought, viz; that under proper conditions, and where a fair knowledge of the limitations and difficulties obtains, motor truck transportation promises to play an important role in rural districts.

Mechanically, the experimental stage for the motor truck has passed. Its worth and its efficiency have been demonstrated very thoroughly under the most trying circumstances.

As operating equipment in a regularly established transportation business, where the financial difficulties faced by the ordinary common carrier are in evidence, the motor truck may still be considered as in the experimental stage. The problem of lifting it from this experimental stage is one that depends for its solution on careful planning and good business judgment rather than on greater mechanical perfection of the truck itself.

If the prospective operator can force himself to consider his motor equipment as merely a means toward an end, and will devote himself to a consideration of his business problems, his chances for success will be increased manifold. The motor truck as a common carrier has come to stay, but the measure of success for the individual will depend, as in other lines of business, on initiative and a proper sense of business proportions.

Syracuse, N. Y.
PAT. JAN. 21, 1908

LIBRARY OF CONGRESS
00026717255